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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,589	08/10/2001	Peter N. Yianilos	13845	8179

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EXAMINER

LEROUX, ETIENNE PIERRE

ART UNIT	PAPER NUMBER
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2161

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/927,589

Applicant(s)

YIANILOS ET AL.

Examiner

Etienne P LeRoux

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 28-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Claim Status

Claims 28-41 are pending; claims 1-27 having been cancelled. Claims 28-41 are rejected as detailed below.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 29 and 35-41 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The following elements critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

Claim 35:

- 1) interval hash value computing module
- 2) a synchronization module coupled to the database and to the interval hash value computing module

Claim 29:

- 1) at least a first and a second sub-sub-interval
- 2) a first and a second sub-sub-interval summary hash

Claims 36-41 are rejected for being dependent from a rejected base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 28-30, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Pat No 6,141,664 issued to Boothby and further in view of US Pat No 5,440, 732 issued to Lomet et al (hereafter Lomet).

Claim 28:

Boothby discloses:

receiving from the remote transaction database [Fig 1, 14] a single summary computed for database records lying in an interval in the remote transaction database [col 5, lines 33-38]

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comparing [COMPARE function, col 9, lines 9-55] the single summary to a local single summary computed for database records lying in a same interval in the local transaction database [Fig 1, 13, col 5, lines 33-38]

when the single summary does not match the local summary hash, partitioning the interval into at least a first and a second sub-interval and requesting from the remote transaction database a first sub-interval summary and a second sub-interval summary, the first sub-interval summary computed for database records lying in the first sub-interval in the remote transaction database and the second sub-interval summary computed for database records lying in the second sub-interval in the remote transaction database [incremental synchronization, col 5, line 20]

whereby the local transaction database can avoid synchronization of database records in a sub-interval with a local sub-interval summary that matches a sub-interval summary received from the remote transaction database [records are joined in a CIG, col 10, lines 60-65]

Boothby discloses the essential elements of the claimed invention as noted above but does not disclose a summary hash. Lomet discloses a summary hash [col 9, lines 40-65]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Boothby to include a summary hash as taught by Lomet for the purpose of accessing single records [col 9, line 40-45]. The skilled artisan would have been motivated to modify Boothby per the above for the purpose of providing superior performance for accessing records in a database [col 9, lines 53-56].

Claim 29:

The combination of Boothby and Lomet discloses the elements of claim 28 as noted above and furthermore, Boothby discloses when the local sub-interval summary hash does not

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match the sub-interval summary hash received from the remote transaction database, further partitioning the sub-interval into at least a first and a second sub-sub-interval and requesting from the remote transaction database a first and second sub-sub-interval summary hash, the first sub-sub-interval summary hash computed for database records lying in the first sub-sub-interval in the remote transaction database and the second sub-sub-interval summary hash computed for database records lying in the second sub-sub-interval in the remote transaction database [two records are joined to form a SKG, col 9, lines 3-7, Fig 7, steps 250-258]

Claim 30:

The combination of Boothby and Lomet discloses the elements of claim 28 as noted above and furthermore, Boothby discloses when the local sub-interval summary hash does not match the sub-interval summary hash received from the remote transaction database, requesting from the remote transaction database a hash value for each database record lying in the sub-interval [col 12, lines 37-42]

Claim 35:

Boothby discloses a synchronization module [Fig 1, 15] coupled to the database [Fig 1, 13] and to the interval computing module, the synchronization module configured to identify database records that need synchronization by comparing a summary interval value computing module computed for database records lying in an interval of the database with a remote summary hash received from a remote transaction database [Fig 3, col 5, lines 42-55]

Boothby discloses the elements of the claimed invention as noted above but does not disclose an interval hash value computing module coupled to the database configured to compute a summary hash of a plurality of hash values, each hash value associated with a database record

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lying in an interval of the database. Lomet discloses an interval hash value computing module coupled to the database configured to compute a summary hash of a plurality of hash values, each hash value associated with a database record lying in an interval of the database [col 9, lines 40-65]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Boothby to include an interval hash value computing module coupled to the database configured to compute a summary hash of a plurality of hash values, each hash value associated with a database record lying in an interval of the database as taught by Lomet for the purpose of accessing single records [col 9, line 40-45]. The skilled artisan would have been motivated to modify Boothby per the above for the purpose of providing superior performance for accessing records in a database [col 9, lines 53-56].

Claim 37:

The combination of Boothby and Lomet discloses the elements of claim 35 as noted above and furthermore, Boothby discloses wherein the synchronization module is further configured to partition an interval into at least a first and second sub-interval when a summary hash for the interval in the database does not match a remote summary hash so as to seek remote summary hashes for the first and second sub-intervals from the remote transaction database [col 2, lines 25-40, prior synchronization is over a narrow date range and present synchronization is over a wide data range].

Claims 31, 32, 36, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Boothby and Lomet and further in view of US Pat No 5,668,958 issued to Bendert et al (hereafter Bendert).

Claim 31:

The combination of Boothby, Lomet and Bendert discloses the elements of claim 28 as noted above and furthermore, Boothby discloses wherein the interval hash value computing module computes a summary hash for database records lying in an interval in the database by combining the hash values associated with each database record lying in the interval [col 17, lines 11-35].

Claim 32:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 35, 36 and 38 as noted above and furthermore, Lomet discloses wherein the summary hashes for different intervals are stored in a tree structure [col 9, lines 40-60].

Claim 36:

The combination of Boothby and Lomet discloses the elements of claim 35 as noted above but does not disclose wherein the database further comprises a transactional support layer to support a storage layer of the database, the transactional support layer further comprising shadow blocks which provide for atomized updates to the storage layer. Bendert discloses wherein the database further comprises a transactional support layer to support a storage layer of the database, the transactional support layer further comprising shadow blocks which provide for atomized updates to the storage layer [col 17, lines 12-35]. It would have been obvious to one of

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ordinary skill in the art at the time the invention was made to modify the above combination of references to include wherein the database further comprises a transactional support layer to support a storage layer of the database, the transactional support layer further comprising shadow blocks which provide for atomized updates to the storage layer as taught by Bendert for the purpose of providing a two stage process of making changes [col 17, lines 11-35]. The skilled artisan would have been motivated to modify the above combination of references such that if the update process is interrupted due to say a power failure, the update process can be rolled back and data integrity can thus be maintained [col 17, lines 11-35].

Claim 38:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 35 and 36 as noted above and furthermore, Boothby discloses wherein the interval hash value computing module computes a summary hash for database records lying in an interval in the database by combining the hash values associated with each database record lying in the interval [col 17, lines 11-35].

Claim 39:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 35, 36 and 38 as noted above and furthermore, Lomet discloses wherein the summary hashes for different intervals are stored in a tree structure [col 9, lines 40-60].

Claims 33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Boothby, Lomet and Bendert and further in view of US Pat No 5,089,952 issued to Bozman (hereafter Bozman).

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Claim 33:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 28, 31 and 32 as noted above but does not disclose wherein the tree structure is a B+ tree structure. Bozman discloses a B+ tree structure [Fig 6 and col 10, line 59 through col 11, line 13]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include a B+ tree structure as taught by Bozman for the purpose of providing a simple tree structure in which all data is stored in the external nodes (i.e. leaf nodes) and the internal nodes contain separator keys which provide a route to the leaf nodes. The ordinarily skilled artisan would have been motivated to incorporate a B+ tree to improve the above combination of references by providing an efficient method for searching for data [Bozman, col 4, lines 40-60].

Claim 40:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 35, 36, 38 and 39 as noted above but does not disclose wherein the tree structure is a B+ tree structure. Bozman discloses a B+ tree structure [Fig 6 and col 10, line 59 through col 11, line 13]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include a B+ tree structure as taught by Bozman for the purpose of providing a simple tree structure in which all data is stored in the external nodes (i.e. leaf nodes) and the internal nodes contain separator keys which provide a route to the leaf nodes. The ordinarily skilled artisan would have been motivated to incorporate a B+ tree to improve the above combination of references by providing an efficient method for searching for data [Bozman, col 4, lines 40-60].

Claims 34 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Boothby, Lomet and Bendert and further in view of US Pat No 5,778,375 issued to Hecht (hereafter Hecht).

Claim 34:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 28, 31 and 32 as noted above but does not disclose wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values. Hecht discloses wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above combination of references to include wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values as taught by Hecht for the purpose of compressing the data [col 7, line 20].

Claim 41:

The combination of Boothby, Lomet and Bendert discloses the elements of claims 35, 36 and 38 as noted above but does not disclose wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values. Hecht discloses wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values. It would have been obvious to one of ordinary skill in the art at the

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time the invention was made to modify the above combination of references to include wherein the hash values are message digests and wherein the hash values are combined to compute a summary hash by using an exclusive OR (XOR) of the hash values as taught by Hecht for the purpose of compressing the data [col 7, line 20].

Response to Arguments

Applicant's arguments filed 2/16/2005 with respect to claims 28-41 have been considered but are moot in view of above new ground(s) of rejection.

Applicant states on page 9, "New claims 28-41 are fully supported by applicant's disclosure and contain no impermissible new matter. Examiner is not in agreement. Applicant is referred to above rejection of claims 29 and 35-41 under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling.

Conclusion

Applicant's submission of the requirements for the joint research agreement prior art exclusion under 35 U.S.C. 103(c) on 2/16/2005 prompted the new ground(s) of rejection under 37 CFR 1.109(b) presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.02(l)(3). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Etienne P LeRoux whose telephone number is (571) 272-4022. The examiner can normally be reached between 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on (571) 272-4023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Etienne LeRoux

4/29/2005

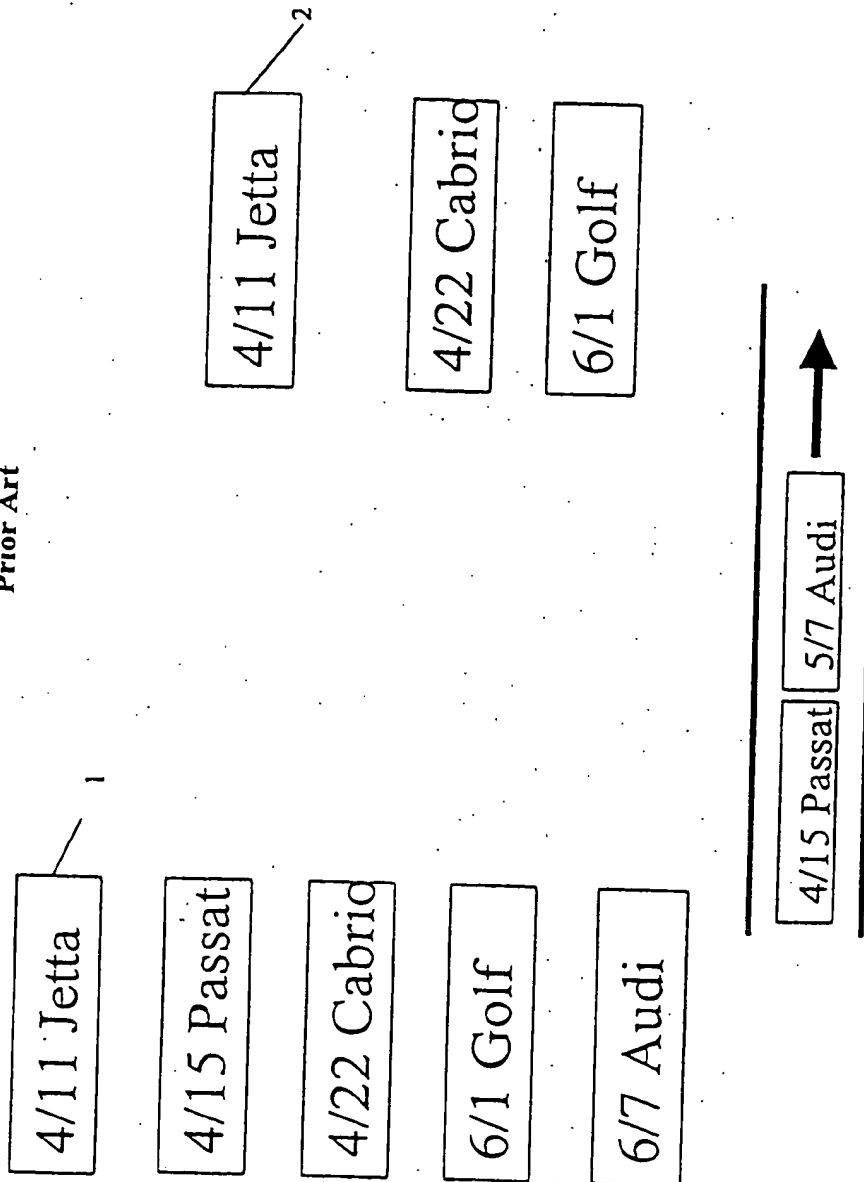

MOHAMMAD ALI
PRIMARY EXAMINER



accepted:
EPH/kaw
4/29/05

Figure 1

Prior Art



accepted
EP office
4/29/05

Figure 4

